IN THE CLAIMS:

1. (Currently Amended) A laser, comprising:

a solid-state laser gain medium having a first surface and a second surface opposite to and substantially parallel with said first surface, wherein said solid state laser gain medium comprises an optical axis that is not parallel with said first surface and said second surface;

an index matched layer attached to said first surface of said laser gain medium, wherein said index matched layer comprises about the same index of refraction as said laser gain medium and further comprises at least one edge that is not parallel with said first surface; and

means for optically pumping said index matched layer from said at least one edge, wherein pump light does not pump said gain medium along or parallel to said optical axis.

2. (Original) The laser of claim 1, wherein said index matched layer is optically pumped from two or more edges.

3. (Original) The laser of claim 1, wherein said index matched layer comprises an index of refraction difference Δn with respect to the index of refraction n of said laser gain medium, wherein $\Delta n / n$ is less than or equal to cos (t/s)–1, wherein t is the thickness of said laser gain medium and s is the longest path found across the aperture.

4. (Original) The laser of claim 1, wherein said laser gain medium comprises an index of refraction that is lower than the index of refraction of said index matched layer.

5. (Original) The laser of claim 1, further comprising a reflective layer attached to said second surface of said laser gain medium.

6. (Currently Amended) The laser of claim 1, wherein said ~~undoped~~ index matched layer has a thickness that is adjusted to adequately trap the pump light, and ~~the doped layer~~ wherein said gain medium has a thickness and length that are adjusted to adequately absorb the pump light.

7. (Currently Amended) The laser of claim 1, wherein said ~~undoped~~ index matched layer has a thickness that is adjusted to accept the amount of pump light required for the desired output power.

8. (Currently Amended) The laser of claim 1, wherein said ~~the doped layer~~ gain medium has a thickness and length that are adjusted to adequately absorb pump light while keeping the inversion density high for efficient laser extraction and the surface stress caused by heat gradients within limits.

9. (Original) The laser of claim 1, wherein said solid-state laser gain medium comprises a disk.

10. (Original) The laser of claim 1, wherein said solid-state laser gain medium comprises a slab.

11. (Original) The laser of claim 1, further comprising means for cooling said laser.

12. (Currently Amended) The laser of claim 11, further comprising a reflective layer attached to said second surface of said laser gain medium, wherein said means for cooling said laser comprises a microchannel cooler attached to said reflective layer.

13. (Currently Amended) The laser of claim 12, wherein said microchannel cooler comprises a high performance microchannel cooler.

14. (Original) The laser of claim 5, wherein said reflective layer comprises a high reflector thin-film stack that reflects the laser wavelength at the laser beam extraction angle.

15. (Original) The laser of claim 14, wherein said high reflector thin-film stack comprises at least one layer selected from the group consisting of copper, gold and silver.

16. (Original) The laser of claim 1, wherein said index matched layer comprises an anti-reflective coating designed to transmit the laser wavelength.

17. (Original) The laser of claim 1, further comprising an output coupler positioned to reflect pump light and transmit light from said laser.

18. (Original) The laser of claim 1, wherein said index matched layer and said laser gain medium are diffusion bonded together.

19. (Currently Amended) A method for operating a laser, comprising:

providing a solid-state laser gain medium having a first surface and a second surface opposite to and substantially parallel with said first surface, wherein said solid state laser gain medium comprises an optical axis that is not parallel with said first surface and said second surface;

providing an index matched layer attached to said first surface of said laser gain medium, wherein said index matched layer comprises about the same index of refraction as said laser gain medium and further comprises at least one edge that is not parallel with said first surface; and

optically pumping said index matched layer from said at least one edge, wherein pump light does not pump said gain medium along or parallel to said optical axis.

20. (Original) The method of claim 19, further comprising cooling said laser.

21. (Currently Amended) A method of fabricating a laser, comprising:

providing a solid-state laser gain medium having a first surface and a second surface opposite to and substantially parallel with said first surface, wherein said solid state laser gain medium comprises an optical axis that is not parallel with said first surface and said second surface;

attaching an index matched layer to said first surface of said laser gain medium, wherein said index matched layer comprises about the same index of refraction as said laser gain medium and further comprises at least one edge that is not parallel with said first surface; and

providing means for optically pumping said index matched layer from said at least one edge, wherein pump light does not pump said gain medium along or parallel to said optical axis.

22. (Original) The method of claim 21, further comprising designing said index matched layer to have an index of refraction difference Δn with

respect to the index of refraction n of said laser gain medium, wherein $\Delta n/n$ is less than or equal to cos (t/s)–1, where t is the thickness of said laser gain medium and s is the longest path found across the aperture.

23. (Original) The method of claim 22, wherein said laser gain medium is designed to have an index of refraction that is lower than the index of refraction of said index matched layer.

24. (Original) The method of claim 21, further comprising attaching a reflective layer to said second surface of said laser gain medium.

25. (Currently Amended) The method of claim 21, further comprising designing the thickness of said ~~undoped~~ index matched layer so that said ~~undoped~~ index matched layer adequately traps pump light, the method further comprising designing the thickness and length of said ~~doped layer~~ gain medium so that said ~~doped layer~~ gain medium adequately absorbs pump light.

26. (Currently Amended) The method of claim ~~1~~ 21, further comprising designing said ~~undoped~~ index matched layer so that said ~~undoped~~ index matched layer has a thickness that accepts the amount of pump light required for the desired output power.

27. (Currently Amended) The method of claim 21, further comprising designing said ~~doped layer~~ gain medium to have a thickness and length that adequately absorbs pump light while keeping the inversion density high for efficient laser extraction and the surface stress caused by heat gradients within limits.

28. (Original) The method of claim 21, further comprising providing means for cooling said laser.

29. (Currently Amended) The method of claim 21, further comprising attaching a reflective layer to said second surface of said laser gain medium, further comprising attaching a microchannel cooler to said reflective layer, wherein said microchannel cooler is used for cooling said laser.

30. (Original) The method of claim 21, further comprising attaching an anti-reflective coating to said index matched layer, wherein said an anti-reflective coating transmits the laser light emitted by said laser.

31. (Original) The method of claim 21, further comprising providing an output coupler positioned to reflect pump light and transmit light from said laser.

32. (Original) The method of claim 21, further comprising diffusion bonding said index matched layer and said laser gain medium together.